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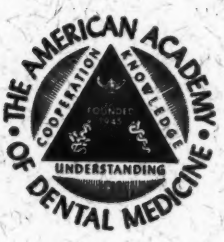

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(*Quoted from the Constitution*)

"To promote the study and dissemination of knowledge of the cause, prevention and control of diseases of the teeth, their supporting structures and adnexa and related subjects; and to foster and promote a better scientific understanding between the fields of dentistry and medicine."

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OCCLUSION—THE ORTHODONTIC POINT OF VIEW*

SAMUEL HEMLEY, D.D.S., F.A.C.D., *New York, N. Y.*†

It is most gratifying to find that occlusion is considered of sufficient importance to be made the topic of a symposium. This is particularly true when the panel is composed of men in various departments of dentistry. We[1] have always emphasized the fact that "Occlusion is the basis of all dentistry. Every phase of dental practice has for its objective either the maintenance of normal or the restoration to normal occlusion when any deviation from the normal exists. The correction of *abnormal* occlusion plainly implies a restoration to normal. But, obviously, one must first know what is normal before any abnormal condition can be recognized as such."

DEFINITION OF TERMS

It is important that we define our terms lest confusion arise because of our failure to do so. The term occlusion refers to the manner in which the maxillary and mandibular teeth meet during the functional excursions of the mandible.[1] The maxillae, it will be recalled, are fixed to the cranium and thus immobilized, whereas the mandible is relatively free and is the articulate or movable component in mastication. It must be emphasized that occlusion is not merely the status of the teeth in "centric" occlusion, but includes all the various relationships of the maxilliary and mandibular teeth as they meet in the course of mastication."

The Dictionary of Dental Science and Art by Dunning and Davenport[2] defines occlusion as "The act of closing or shutting, as of the teeth. The natural closure and fitting together of upper and lower teeth; the relation of the mandibular and maxilliary teeth, when closed or during those excursive movements of the mandible whereby masticating efficiently is obtained. Sometimes incorrectly called "Articulation." Under 'articulation' the same authors (p. 63) say "This term refers only to the placement of porcelain teeth on the articulator, and should not be used to describe the *occlusal relation* so established between such teeth."

Dorland[3] in his Medical Dictionary defines occlusion as "The contact of the teeth of both jaws when closed or during those excursive movement of the mandible which are essential to the function of mastication." And follows with (A.D.A.) to signify that the source of his definition is the American Dental Association.

The A.D.A. Committee on Nomenclature, in its report in 1937,[4] defines:

"*Articulation.* The arrangement of artificial teeth to conform to the requirements of the edentulous space or spaces which they are to occupy, and to adequately serve the purposes of the natural organs which they are intended to replace.

Note: Articulation refers to the actual placing of artificial teeth, one by one, into the required position; but articulation is not to be used to describe the occlusal relations of artificial teeth after they have been so arranged. On p. 129 of the report, occlusion (*L. occludo,* to close together, to shut). The contact (relation) of the teeth of both jaws when closed (together) or during those excursive movements of the mandible which are essential to the function of mastication."

NORMAL OCCLUSION

It is obvious that we should next attempt to define and describe *normal occlusion.* There are many definitions of normal occlusion, but it will be found that none of them conveys a specific concept of the morphology of the normal. Much will depend on the time when the definition was written because our concept of normal occlusion has undergone many changes since it was first enunciated.

Previous to 1900, there was no universally accepted concept of normal occlu-

* Part of a Symposium on Occlusion for Dean's Day, Columbia University, February 17, 1950.

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sion. Esthetics was the essential guiding factor in the determination of a normal occlusion and only extreme deviations from the normal were commonly subjected to orthodontic treatment. Extractions were frequently resorted to to facilitate treatment. Angle, who like the others had resorted to extractions in the earlier part of his career, observed the frequency of failures and the poor results attained. As a result of these observations and his keen application to the study of occlusion, he arrived at the conclusion that extractions were never indicated. In fact, he introduced the term "mutilated cases" to apply to those dentures in which teeth had been lost. His study of the morphology of teeth led him to the concept of the "hypothetical ideal," an occlusal arrangement in which each tooth had a definite relationship not only to those adjacent to it but also to those which it met in occlusion. This concept was immediately accepted by the profession as the basis for the evaluation of all dentures and any deviation from this hypothetical ideal was deemed a malocclusion. This concept applied only to the occlusal inclined planes of the teeth and did not take into consideration their axial position. He taught the concept that when the teeth were placed into positions of correct inclined plane relationships the correct axial positions would ultimately be attained through the action of the forces of occlusion. At that time, therefore, the concept of normal occlusion was merely the normal relationship of the occlusal inclined planes of the teeth.

However, his promise was not fulfilled and, in 1908, he changed the design of his appliance in a manner that would permit the application of force to change the axial positions of the teeth by moving the apices. This appliance, the working retainer, was so difficult to use that it was soon modified, first to the pin and tube appliance and then, a few years later, to the ribbon arch and finally to the edgewise arch. All of these changes were made merely to facilitate its use and make it not only easier to use, but also, mechanically more efficient. The objectives in the use of these modifications were changed only to the extent that the proper axial positioning was now to be brought about through appliance therapy. Now that it was possible to produce force in a manner that should move the apices of teeth, it was assumed that this movement would inevitably follow.

CONCEPTS OF THE NORMAL DENTAL ARCH

Angle's hypothetical ideal of the cuspal relationships did not indicate the form that the dental arch was to assume. It remained for Hawley to adopt the concept of arch form in 1904. He was influenced by an earlier work done by Bonwill. In 1886, in the American Text-Book of Prosthetic Dentistry[5] Bonwill conceived of the ideal arch form which was constructed upon the equilateral triangle, the base representing the distance between the condyles and the apex of the triangle resting between the central incisor teeth at their cutting edges. The six front teeth are arranged in an arc of a circle the radius of which is determined by the combined widths of the central, lateral, and canine teeth. From the distal point of the canine the biscuspids and molars are arranged in straight lines passing to the extremities of the base of the triangle, the points of the buccal cusps being cut by the line.

In the practical application of this form of arch to the arrangement of artificial teeth, Dr. Bonwill constructed an articulator upon the basis of a four inch equilateral triangle, this having been found to be the average width between the condyles in an examination of a great number of skulls, the width varying from three and one-half to five inches.

Hawley[6] modified this concept slightly, he said, "In orthodontia we meet a different problem. We have presented a set of teeth to rearrange in the living subject. We can determine the exact widths of the teeth. There is no means of measuring the width between the condyles with any degree of accuracy, and we cannot place them in the average arch based upon the four-inch triangle. The arch must be found from some other data, and we will select the front teeth." With

this measurement as a basis, he constructed a geometric pattern which represented to him the normal arch form. He goes on, to prove that "such diagrams will always be similar and proportional to the radii," the radius being the combined widths of the central, lateral and canine teeth of the maxilla. Thus, we have now a concept of uniform arch patterns for all people and in conjunction with Angle's hypothetical ideal occlusion, it becomes a very simple matter by inspection and measurement to note deviations from this hypothetical concept. This procedure required a relatively more difficult task to construct the geometric design in order to obtain the measurement supposedly required between the premolars and molars, so in 1909 Pont, of Lyons, France concocted a simpler procedure. He worked out a table of widths which he suggested as normal for the premolar and molar regions for each variation in the combined widths of the maxillary incisors. This likewise gave a uniform pattern for all widths and it was simple to use. Hence, it was immediately adopted and has been in general use ever since.

It is patent from the above explanation that these concepts are not biologic in origin, but merely hypotheses which were conceived to assist and guide the dentist. However, they were adopted as truths and deviations from this pattern were deemed to be abnormalities. The attempt to establish this pattern for all patients resulted in failure and in 1919, we find the first scientific approach to the problems of normal occlusion in a presentation by A. LeRoy Johnson[8] entitled, "The Individual Normal—The Problem of Orthodontia." One cannot better express the important principles he presented, so I shall take the liberty of quoting directly some of the more vital points he made.

"The concept of the normal dental arch is the foundation of modern dentistry. Although the dental arch is often referred to as being composed of the teeth and their supporting structures, a dogmatic definition of it does not convey a true idea of the nature of the conditions which surround all dental operations. The concept of the dental arch is not limited to a study of the morphologic characteristics of the teeth together with their supporting and surrounding structures; it is more comprehensive. It is a concept derived from a study of the action, reaction, and interaction of different elements of the dental arch in the continual adjustment of life; it is a concept of the nature of living tissues as they stand in physiologic correlation."

"Orthodontia is ordinarily defined as 'that science which has for its object the correction of malocclusion of the teeth.' Such a definition is of little value because it does not convey an idea of the nature of the problem involved in the correction of malocclusion. We believe it to be nearer the truth to define orthodontia as that branch of dentistry which treats of the forces controlling the form of the dental arch. This indicates in a general way, at least, the extent of the phenomena to be considered in diagnosis and treatment. The form of an organ or part is the result of an interaction of forces; it is the result of the interaction of function and structure. Structural form cannot be accounted for by environmental factors alone, neither can heredity explain away all variation. It is the interaction of one with the other, the combined influence of the extrinsic with the intrinsic which determines the form of structures. Therefore, the subject matter of the science of orthodontia, is derived from the two phases of biology, heredity and environment, and is, in the main, a study of the fundamental truths and laws of science as they are expressed in the growth and development of the dental arch of the living human being; and the relation of these truths and laws to specific abnormal structural conditions. Orthodontia is essentially a science of form development.

From such a standpoint as this, the field of orthodontia broadens beyond a study of occlusion. Inasmuch as the teeth are the primary factors in the evolution of the dental arch, and the principle function for which they exist lies in the

physical relations of their crowns, the study of occlusion constitutes a large part of science. It is, in a degree, an index of the developmental condition of the adjacent structures of the teeth and a register of the forces acting upon them."

"The crowns of the teeth are completely developed in adult form long before they function in mastication and in use they wear away, while bone, muscle, vascular and nervous tissues depend for their complete development upon the stimuli of function. This wide difference in the developmental characteristics of the tissues which compose it, make variations in the form of the dental arch more obvious than in other parts of the organism where the tisues are more nearly of like nature. For this reason a scientific interpretation of the normal is more essential in orthodontia than in other fields of orthopedia where the structures are, in a greater degree, molded and harmonized by function in the ordinary activities of life. In fact, the fundamental problem in orthodontia is to determine the normal dental arch of the individual organism. It is a problem of the individual as distinguished from class, group, or species and as such is inseparably linked with the phenomena of variation.

"The most obvious thing about the individual organism is its variability. Variation in form and function is universal among living beings. Although two individuals will resemble each other, possessing certain characters in common, yet invariably upon close examination these characters will be found to differ from each other in degree or in proportion. Differences extend to minute particulars and include all Characters, function as well as structure, internal organs and parts as well as external proportions. No part of the living being escapes the influence of the law of variation. Hence, an interpretation of the normal as it refers to the dental arch of the individual organism must find a basis in this law and must be determined by the methods employed in the analysis of the material relative to it."

"The word *type* used with individual refers to certain marked racial characteristics which the individual possesses. It directs attention to certain traits or features which are common to different individuals. It cannot in any sense apply to the individual as a specific standard of normality, for there is a great range of individual variation without departure from type."

"If the typical is utilized as a definite standard of normality of the individual and all variations from it classified as abnormal then the normal individual does not exist. It is not reasonable to base our diagnosis upon a concept which can never be realized in natural forms.

"The scheme of occlusion expressed in the ideal relations of the inclined planes of the cusps of the teeth is a working hypothesis; it is a theory to be adopted as a guide in an investigation of the real nature of occlusion. A hypothesis is not proved; it is assumed to account for a fact or an occurrence.

"A hypothesis leads to facts, it does not express actual conditions already established. The ideal scheme of occlusal relations commonly called 'normal occlusion' is a concept derived from a study of the law of occlusion, and is the mental picture, the working hypothesis, essential in an investigation of the nature of occlusion, as it is in the mouths of men today. Such a concept furnishes the groundwork for a study of the facts, the real evidence which constitutes so vital a part of the subject matter of orthodontia."

"The species normal is a concept derived from the observation and comparison of the occlusal relations of the teeth of many organisms. It is the result of combining, of bringing together in one concept a variety of structural conditions, each different from the other, no two alike."

"The 'individual normal' is the result of the correlated activity of many parts of the individual organism. It is the result of a complex of physiologic processes. The Individual Normal refers to the form of occlusion best adapted to the needs of the organism as a whole. It

refers to the condition of occlusal relations which is the most effective in maintaining in its most stable form the equilibrium expressed in the life phenomena of the individual organism. It may or may not approximate the species normal. It is not an artificial creation built upon an ideal plan. It is the most perfect condition of occlusion that the nature of the tissues and the functional activities of the organism as a whole will permit."

"The dental arch is a mobile equilibrium reflecting the inheritance and life activities of the individual organism as a whole. To know when the form of a dental arch is normal for a particular individual is a difficult problem, and its solution, which is so vital to orthodontia, involves a consideration of the fundamental principles and laws of science. There is no short cut to a solution of the problem of deformities of the dental arch."

EXTRACTIONS IN ORTHODONTICS

These concepts and principles were accepted by all and proved, and from that time, 1919, up to and including the present, we hear the statement repeated and sincerely believed. But while this lip service is being rendered, we find the profession is still continuing to impose a uniform, preconceived pattern of occlusion on all their patients. As a result of the failure to attain this uniform pattern of occlusion, in 1926, a wave of extractions in orthodontics occurred. At that time, the two maxillary first premolars were extracted in accordance with a preconceived hypothetical ideal proposed by Simon.[9] This hypothesis had no foundation in fact and it was based wholly on the "as if," philosophy. It was claimed that even though it were not true, the foundation for his concepts could be used "as if" it were true. This attempt to impose another preconceived and uniform pattern of occlusion on all patients failed as did the attempt to impose the hypothetical ideal of Angle coupled with the uniform arch pattern of Hawley and of Pont.

Finally, just a decade ago, a new philosophy sponsored by Charles A. Tweed,[10] revived an old practice of extracting the four first premolars in order to attain another hypothetical ideal. By this method it is hoped to attain not only better esthetics but also greater constancy in the relationship of the anterior teeth to each other. The common occurrence of slight rotations of even one incisor was deemed a sign of failure when this phenomenon manifested itself after the removal of appliances. It was hoped that the procedure espoused by Tweed would avoid this tendency to crowd the lower incisors.

VARIATIONS OF OCCLUSAL PATTERNS

In the examination of patients who most nearly approximate the ideal occlusion, it will be found that the variations of the occlusal pattern occur primarily in the anterior segments. It is in this region that we find differences in the extent of vertical overbite, differences in the procumbency of the incisors and the presence of slight rotations, or even slight spacing between the incisor teeth. Rarely do we find variations in the posterior segments and when they do occur, they deviate much less from the hypothetical ideal than do the anterior teeth. The Tweed philosophy would reverse this and make the anterior segment the more constant and, as a result of four extractions, destroy the tendency to constancy in the posterior segments.

There would be no objection to the basic philosophy underlying any of the many plans of treatment, were it feasable to impose the changes they propose on the tissues involved. The basic error in all of them is the fact that they attempt to impose a uniform pattern of occlusion on all individuals and they have all failed to apply the lessons which should have been learned from the work that was first presented by Johnson[8] in 1919. We must at all times attempt to find the Normal for the individual and we will then have "the condition of occlusal relations which is the most effective in maintaining in its most stable form the equilibrium expressed in the life phenomena of the individual organism. It may or may not approximate the species nor-

mal. It is not an artificial creation built upon an ideal plan. It is the most perfect condition of occlusion that the nature of the tissues and the functional activities of the organism as a whole will permit." Not only do occlusions vary from one another, but the occlusion of the same individual varies with age. "Occlusion is not a static phenomen.[1] On the contrary, it changes with growth of the jaws and during the transition from decidous to permanent dentitions, as well as with the stress and wear of the teeth in later years. What is more, the normal, both with reference to the *ideal* relationship of he teeth and with regard to function, is not identical in the deciduous and permanent dentitions, nor indeed in the transition between these two, even in the same individual."

This fact is apparently known not only by the profession, but even by the public. No one expects to find a completed adult occlusion in a child. However, despite the fact that this is common knowledge, we have children referred to us daily because of apparent deviations from the adult pattern. Relatively deeper overbites, spacing between incisors and some irregularity in the alignment of mandibular incisors are often normal phenomena in the early stages of the transition from the deciduous to the mixed dentition. Growth changes will often modify the deeper overbite and the forces of occlusion will close the spaces between the maxillary incisors and establish the normal alignment of the mandibular incisors. The permanent teeth do not erupt into the precise positions they will ultimately assume; the pressure of the muscles, acting sometimes directly on individual teeth or at other times through the included planes of the cusps of the teeth, will guide the individual dental units into their proper positions. It is as a direct result of this force acting through the inclined planes that the teeth acquire their proper axial inclinations. One must be cautious not to mistake some of the cuspal relations at this time for traumatic occlusion. To attempt to modify the forms of the cusps at this time would be depriving nature of her means of establishing the normal pattern. It is important to remember that we should guide and help the work of nature and not assume that we can do the task of developing the dentition better than she. In periodontia, as well as in orthodontics, we must remember that there is no single, uniform pattern of occlusion and that occlusion is constantly changing. There is an ever increasing demand to equilibriate the occlusion immediately upon the removal of orthodontic appliances. We should remember that no orthodontist can predetermine the precise position of each tooth in the final result. The final adjustments are made by Nature, and no case should be considered as completed until some time after all appliances have been removed. It is only as a result of the final adjustments by Nature that all of the individual variations in occlusion become evident.

CONCLUSION

A most interesting fact regarding this entire discussion is that the public and the profession both are cognizant of the variations in occlusion. This is evidenced when patients who require artificial dentures request that some of the artificial teeth be rotated somewhat so that the teeth might look natural and if the patient does not make the request, the dentist will most likely make the suggestion. However, when these same patients bring their children or grandchildren to the orthodontist, or when the dentist refers children for orthodontic treatment, it is expected that the result will be an absolutely perfect alignment with no trace of a rotation and no variation in the overbite or procumbency[11,12] of incisors. In other words, it seems that we often think, fallaciously, that we can alter the ways of Nature; in this instance, it is desired to make the natural teeth look artificial and the artificial teeth look natural.

745 Fifth Avenue

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A.D.A. Campaign to Help Need for New Dental Books Abroad

Dentists and dental societies throughout the United States are urged to give concerted support to the campaign of the American Dental Association to help raise world health standards by establishing new dental libraries overseas through the CARE-UNESCO Book Fund Program. A $250,000 goal has been set for the campaign.

The plan to share American dental knowledge with dentists in war depleted countries of Europe and Asia has been approved by the A.D.A. House of Delegates and is under the direction of Dr. Stanley Tylman, of Chicago, chairman of the A.D.A. Council on International Relations.

Funds donated by individuals and organizations here are used by CARE-UNESCO representatives to buy the latest and best scientific and technical books for educational institutions abroad.

Dental text and reference books have been requested as priority needs by such institutions as the new U. S.-sponsored Free University of Berlin; the Dental School of the University of Athens, Greece; the University Library of Brussels, Belgium, and the Library of the Institute of Science in Manila, the Philippines.

In every instance, the CARE-UNESCO reports show, reconstruction efforts are hampered by the lack of books to train professional men in new scientific technics.

Book stocks were depleted first by the wartime confiscations and book-burnings carried on by the invading armies as part of their conquest plans.

Then came the bombings, which took a tremendous book toll: 150,000 books destroyed at the University of Vienna. . . . The library of the University of Caens, France, completely demolished. . . . 900,000 books reduced to ashes at the University of Louvain, Belgium. . . . $1,000,000 worth of books lost at the University of the Philippines. Aggravating those losses was the fact that no new books were received throughout the war years.

The end of the war did not end the book shortages. Virtually all technical-book publishing in recent years has been done in the United States. The lack of dollars continues to make it impossible for foreign universities and libraries to buy the up-to-date books so easily available here.

Dentistry is one of 20 scientific book categories CARE, in cooperation with UNESCO, is helping provide for libraries abroad through the Book Fund Program, which was added to the CARE food and textile package service last spring. Funds contributed to the A.D.A. campaign will be used by CARE to buy and deliver the latest and best books on dental science to dental schools and libraries, in the name of the American Dental Association.

It is hoped that, through the A.D.A. campaign, at least 50 institutions will be benefited in the countries served: Austria, Belgium, Czechoslovakia, Finland, France, Great Britain, Greece, Western Germany and Berlin, Italy, the Netherlands, Norway, Malta, Japan, Korea, the Philippines, Siam and Pakistan.

CARE's purchases of dental books are based on an extensive bibliography compiled by a professional committee of scientists and librarians. The subdivisions covered include caries treatment, oral pharmacology, oral prosthesis, dental materials, prophylaxis, oral diseases, orthodontia, oral anatomy, physiology and histology.

Each book purchased through the A.D.A. campaign will bear a book plate inscribed: "A Gift from the American Dental Association"—a lasting memorial of the willingness of American dentists to share their technical knowledge. All contributions should be earmarked for the CARE Book Fund Program and sent to the American Dental Association, 222 East Superior Street, Chicago 11, Ill.

THE PERIODONTIST'S VIEW OF OCCLUSION*

SAMUEL CHARLES MILLER, D.D.S., F.A.C.D., F.A.D.M.†

THE PLACE OF OCCLUSION IN THE ETIOLOGY OF PERIODONTAL DISEASE

Until 1914, when the American Academy of Periodontology was founded, Periodontia was essentially an art the secrets of which were locked in the professional lives of only a few men. With the establishment of the Academy, Periodontia became a science so that its knowledge could be transmitted from one practitioner to another and carried forward from generation to generation.

Periodontal disease is now considered curable because the cause is known. This cause is not a single factor but a combination of many factors, in each case in varying combinations. The causes fall into three groups: Dysfunctional, Irritational, and Systemic Factors. (Fig. 1).

In the dysfunctional factors, occlusal dysfunctions play the major role. It must be understood that traumatic occlusion was considered by Stillman and McCall as a factor which has produced or is capable of producing diseases of the periodontal tissues. Traumatic occlusion thus implies potentiality as well as actuality. Traumatic occlusion *alone* cannot produce periodontal disease.

ETIOLOGIC FACTORS IN PERIODONTAL DISEASE*

Dysfunctional

1. Overfunction
   a. Excessive stress on teeth
   b. Insufficient periodontal support
   c. Too powerful masticatory musculature
2. Underfunction
   a. Premature wear (natural or artificially produced)
   b. Nonocclusion
   c. Indolent mastication
3. Abnormal habits
   a. Unilateral mastication
   b. Abnormal biting habits
   c. Clenching
   d. Bruxism

Irritational

1. Abnormal anatomy
   a. Tooth form
   b. Tooth position
2. Deposits on the teeth
3. Nondetergent diet
4. Food impaction
   a. Vertical
   b. Horizontal
5. Mechanical irritants
   Cavity margins, improper inlay or filling margins, orthodontic appliances; bridges, clasps or dentures which impinge upon or irritate the gingivae.
6. Chemical irritants
7. Atmospheric irritants (mouth breathing)
8. Improper toothbrushing
9. Improper orthodontic procedure

Systemic

1. Faulty nutrition
   a. Acid-base disbalance
   b. Vitamin deficiency
   c. Mineral deficiency
2. Debilitating diseases
3. Blood dyscrasias
4. Endocrine dysfunction
5. Pregnancy
6. Allergies and drug idiosyncrasies
7. Metallic poisonings
8. Radioactive substances
9. Psychosomatic factors

* From Miller, S. C. Textbook of Periodontia, Ed. 3, Phila., Blakiston, 1950.

* Part of a Symposium on Occlusion in Dentistry for Dean's Day, Columbia University, February 17, 1950.

† Professor of Periodontia and Chairman of Periodontia Department, New York University College of Dentistry.

NORMAL OCCLUSION

The periodontist views occlusion as a bio-dynamic ever-altering physiology of the teeth, their supporting structures, oral tissues and the temporomandibular joints, as well as the muscles of the face and neck. Even the lubrication supplied by the salivary glands is part of this functional mechanism. Nor can the state of general health as a bio-functional influence be divorced from our concept.

When the teeth function innocuously and in harmony with the related tissues, the case is in periodontic balance whether the cusps are steep or shallow, or the alignment is good or poor. A good occlusion must be self perpetuating. When new disturbing factors arise such as faulty habits, fractures, or nutritional insults, which derange the function of the teeth, whether they appear "balanced" on the articulator or not, the effect is traumatic and the occlusion ceases to be "normal."

CENTRIC OCCLUSION AND CENTRIC RELATION

The periodontist's ability to return diseased periodontal tissues to health and to cure temporomandibular joint disturbances depends to a great extent on his ability to make centric occlusion coincide with centric jaw relation. From the periodontists' viewpoint, centric occlusion is that relation of the teeth when they have the maximum anatomic intercuspation. This is a purely dental connotation depending on the presence and form of the teeth and their positions in the arches.

Centric relation on the other hand, is the most natural relation of the mandible to the maxillae in the closed position.

It can be seen then that centric occlusion and centric relation need not coincide. In fact in adults appearing for dental and periodontal treatment, they rarely are the same position.

It takes no stretch of the imagination to picture the effects on the periodontium and the temporomandibular joints when the teeth contact in a centric relation which rests on cusp inclines or on one or two high points and must then by mechanical skidding find its maximum centric contactual efficiency. This is multiplied hundreds of times in chewing and other functions with resultant harm to the masticating apparatus.

PHYSIOLOGIC REST POSITION

The teeth cannot and should not be in continuous contact whether so called balanced occlusion is present or not. Like all organs, the periodontal tissues supporting the teeth must rest and replenish. This is permitted by healthful neuromuscular physiology so that in relaxation, the opposing teeth are apart approximately 2 to 4 millimeters. When this space is lost by improper elevation of the degree of opening through so-called bite-raising procedures, the physiologic response is an endeavor to re-establish the free-way space without which the mechanism cannot exist. The teeth will loosen or become painful, the temporomandibular joints may become irritated due to continuous activation, and the alveolar bone rarefies in order to allow a simulated intrusion of the teeth. Such vertical mobility of the teeth as is seen in improper mouth rehabilitation may hardly be considered physiologic adaptation. It is purely pathologic retrogression.

BRUXISM AND BRUXOMANIA

Through emotional tension or exaggerated neuromuscular activity—the latter may be created by a flattened sugar tolerance curve, low serum calcium or a deficiency of thiamin in the diet—the free-way space is lost and recurrent or continual gritting, grinding or clenching of the teeth becomes a regular occurrence. In such cases, the fault does not lie in the dental apparatus but rather in the patient as a whole. Since the fundamental basis of successful treatment is removal of the cause, such etiologic factors even though outside the specialty of dentistry must be eliminated to enable the oral tissues to return to health.

BITING HABITS

The proper functions of the teeth are well known to everyone in this audience. Yet they would differ if we were to consider Eskimos who used the teeth as an instrument of occupation, or if the teeth were filed and reshaped as is done by some savage tribes to enhance their particular aspect of beauty. So in our own society we find many occupational hazards such as thread-biting, pressure of musical instruments, or excessive abrasion through environmental atmosphere, eg. stone cutters, brick-layers. The dentist who clenches his teeth while extracting someone elses or who contracts his oral musculature because of the tension of his work presents an occupational hazard as simple and direct as any.

Such habits as pencil biting, opening of bobby pins, chewing of cigars or holding smoking implements in the mouth, the chewing of toothpicks, gum or hard substances, all are hazards which the periodontal tissue may be unable to withstand, resulting in their eventual breakdown.

UNILATERAL MASTICATION

The habit which is probably given least attention while it deserves the most is unilateral mastication. This may be purely a habit or may be developed as an adaptation to the presence of a pericoronal flap, food impaction area, sensitive erosion, missing tooth or poor efficiency on the other side. The side with greater function presents better periodontal tissues and alveolar bone support while it is *more* susceptible to temporomandibular joint disturbances. An obtuse gonial angle on one side may be an anatomic cause for unilateral mastication on the other.

RELATIVE HARM FROM DYSFUNCTIONAL STRAINS

Within certain limits vertical forces on teeth are borne well, while horizontal forces are poorly tolerated. Vertical force beyond physiologic limits may cause an adaptation in the periapical region such as osteofibrosis but even this, unless complicating factors supervene, reverts rapidly when the nocuous stress is interrupted. All stresses on the teeth have a horizontal component unless they are in a purely vertical direction and even then the effect is modified by cusp angulation and the tooth position. It can readily be seen that a tilted tooth could not in ordinary functioning of the mouth receive only vertical force.

In the correction of occlusion the periodontist endeavors to correct the horizontal stresses so that they fall within physiologic limits. This is done both by reduction of stress through division of labor with other teeth by changing the angle of incidence through reduction of the angle of inclination of the cusp planes, and by increasing efficiency through modified tooth form.

INDIVIDUAL TOOTH EQUILIBRIUM

Whether or not the teeth are in "so-called" balance from the prosthetic standpoint or are in such correct alignment so that a tyro orthodontist might be delighted with the beauty of such a result, the teeth may still be in traumatic occlusion. Stress which strikes only one side of the tooth causes horizontal strain and thus, injury to the periodontal support. If cusps are too steep, even though the casts could be placed on an articulator and many points of contact made in all excursions, the lack of individual tooth equilibrium is an open invitation to periodontal disease and early tooth loss.

RELATION OF CUSP HEIGHT TO AGE AND TISSUE SUPPORT

As the periodontal support ages, certain modifications occur not only in these tissues but in the entire dental apparatus, so that reduction of horizontal stress becomes an increasing necessity. If the dentist is to give the patients the use of their teeth for an entire life span which now must be considered an expectancy of 69 for the male and 71 for the female, he must see to it that the gerodontic changes are minimized to a physiologic level. Physiologically the overbite decreases as

age advances. This is not simply a result of wear. It is the result of a complex adaptation of all involved structures to reduce the injurious horizontal forces. Thus, if we have completely equilibrated an occlusion at the age of 40, we may expect to see the same patient with an anterior nonocclusion at the age of 55 or 60.

OVERBITE AND OVERJET

(Vertical and horizontal overbite)

Although these terms are employed loosely at present, the first will be considered here as the amount of vertical overlap of the anterior teeth, while the latter will be limited to the horizontal distance between the labial surfaces of the lower anterior teeth and the lingual surfaces of the upper anteriors.

Both are individual for each case. Excessive, average or no overbite or overjet may be normal for certain individuals while abnormal for others. What is the use of producing a beautifully equilibrated protrusive excursion if a click is created in the temporomandibular joint? There have been cases where the only solution to this disaster was the reestablishment of the overbite by the construction of porcelain jackets on the upper anterior teeth.

Similarly, an overjet may not only be of no harm where a good protrusive movement is established but may even be a necessity without which migration or injury to the anterior teeth will ensue.

EQUILIBRATION OF OCCLUSION

It is possible by definite steps which can be taught to dental practitioners and undergraduate students to so reform the teeth that they can function harmoniously with their environment. Spot grinding is to be condemned. It is no more sensible to do spot grinding than it would be to fill one cavity when several are present.

RELATION OF THE PERIODONTIST'S CONCEPT TO THAT OF THE ORTHODONTIST

The orthodontist can no longer be satisfied with simple alignment of the teeth to please a doting mother. He must establish a functional, harmoniously stable, occlusion which will with regular dental care carry through to the age of 70. In many cases he can only do this if the form of the teeth as well as their position, is modified so that future stresses will not become strains. He must also consider habits, nutrition and all the other systemic and local factors which may unite to invite early disease and loss of teeth.

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New York Section Report

On February 27th, 1950, the New York Section of the American Academy of Dental Medicine had the pleasure of listening to the results of the work now under way at the New York University School of Dentistry by the Periodontia Department. Under the supervision of Professor Samuel Miller, Drs. Soberman, Iusem, and Stahl presented the "Papanicolaou Smear Technique and Its Relation to the Dentist."

Although it is too early to draw definite conclusions about the work, certain information is becoming apparent. The smear is an important adjunct in diagnosis for malignancies, for nutritional disturbances, and to follow progress of treatment. In the near future further results from this technique will be available.

RUTH ARON
Editor, New York Section

WHAT YOUR DENTAL INFORMATION BUREAU CAN AND CANNOT DO

JOHN W. MILFORD, *New* YORK, *N. Y.*

(This is the third of a series of informative articles on the Bureau by its Director and Public Relations Counsel)

To some members, the Dental Information Bureau should be an agency with such absolute control of the press that nothing in any way undesirable to the profession could be published or broadcast, while at the same time anything the profession wanted to convey to the public would be printed or aired whenever dentistry saw fit to make a pronouncement. This concept, unfortunately, is utterly impossible of fulfillment, for reasons which we shall attempt to explain.

In a country such as this, where we have a free press, no agency, not even the federal government, has any powers of press censorship or control, except in wartime. And that power, even then, applies only to matters affecting national security. Freedom of the press, let us not forget, is one of our most zealously guarded democratic institutions.

Thus, the Bureau has no powers of control, beyond that inherent in relations with editors and writers involving mutual integrity and good will.

Fortunately for the Bureau and all others endeavoring to cultivate good public relations, most editors have a strong sense of ethical and social responsibility. Now and then we see evidences of deviation from the path of journalistic fairness and integrity, but these lapses are comparatively rare.

Most newspapers, magazines and other media have special facilities for checking the accuracy of material to be printed or broadcast. Many of these facilities check with us on all dental material received from various sources and as a rule, accept without reservation our comments and opinions. In rare instances—such as those involving deliberate muckraking on the part of the paper, magazine or radio station—either we are not consulted, or our comments or advice go unheeded.

It is, of course, a physical impossibility for us to keep in touch with everything these various media are doing and planning. Here we must depend upon their fairness, thoughtfulness, and willingness to accept from an official and authoritative information source the true facts on any given dental development or situation.

When a writer approaches us for data, comments or opinions, we have an opportunity to give him the facts. If his angle of approach to a story is one likely to mislead and create confusion, we tactfully point out the hazards. Sometimes we can start him off on another angle, one of genuine educational value to the public. Not infrequently, an editor will ask our opinion concerning the scientific merits of material contained in a manuscript submitted to him by a reporter or free-lance writer who may have let his imagination get the better of him. In such cases we have an opportunity to inform and advise.

Sometimes, however, an editor or author presents a manuscript in which he wants only certain statements checked for accuracy. In such cases, while we may protest other portions of the story, the final determination is up to the publisher. In other cases, without consulting the Bureau, an editor may go to press with a story which, when published, is considered by the profession generally to be misleading or detrimental to the interests of dentistry and the public. In publishing the story, the editor's primary aim may be circulation-building sensationalism. In such a circumstance, nothing that we can do or say will deter him or produce immediate restitution following publication. Sustained diplomatic contact may, however, bring about a change in the editor's attitude or editorial program later on.

In any case, our sole weapons in defense of the profession are moral suasion and friendly editorial relationships.

When a newspaper or magazine publishes a story on a promising new drug or development, and a patient asks his dentist about it, the latter has an opportunity to explain and educate. If the development is rankly experimental, the dentist may so state, and point out that, pending authorative confirmation, he will not use his patients as guinea pigs. He needn't wax indignant, or antagonize the patient by stating flatly that the story is "crazy," and that the patient is "foolish," as a number of dentists did in the case of the Collier's story by Ratcliff on Dr. Gottlieb's enamel-impregnation technic. That simply isn't smart patient relations. It is far better for the dentist to keep informed of these new procedures, and answer patients' questions with dignity and tolerance; for some day, when and if the procedure is officially and generally accepted, he may be using it on just those patients—if he hasn't alienated them by earlier intemperate reaction! Let us remember that every patient-contact represents an opportunity not only to cement patient-relationships, but to contribute to dentistry's public relations as well. It is trite but true that public relations, like charity, begins at home.

Axiomatically, the value of any dental publicity is in direct proportion to the degree and intent to which it advances the profession's public relations objectives. If it does the job, it doesn't particularly matter whether it stems from a local or distant dental meeting. The most important thing is the impression it registers with readers or hearers.

The problem of getting favorable publicity merits some study. Let us consider the news and information sources through which such publicity is obtained. Primarily, the functions of the press and radio are to inform and entertain. Their appeal is to the masses. Each medium has its own audience to which it caters, and these audiences vary. *The New York Times,* for example, is designed for the sophisticated, the studious, the urbane. Certain "tabloids" are slanted at a lower intellectual level, with emphasis on scandal, robbery, and other news sensations. A quick glance through any paper or magazine will tell you the type of reader it is designed to interest.

By and large, it may be said that metropolitan newspapers cover all the news of the world. Not that they actually publish all the news; they can't, they haven't the space; there's too much going on. What they do is publish those items which they believe will be of most interest to their readers. Most of these papers, you've noticed, are departmentalized, with sections devoted to general news, business and financial, women's interests, sports, etc.

"What's new?" is the unvarying query of the curious individual. The newspapers endeavor to answer that question. News is fresh information concerning something that has recently taken place, usually something new or different from what happened yesterday or the day before. And the particular news published in a particular medium is an indication of the type of news or information its readers want.

To obtain publicity in the newspapers, then, dentistry must compete with everything else throughout the world in which people are interested. Thus, a dental meeting may have to compete for news space with a political campaign, strike, murder, earthquake, social scandal, or world war, with available space being further diminished by the comics, sports and fashion events, financial doings, homemaking features, obituaries, etc. When a "big news break" takes place, i.e., something of major news interest in any one of a number of different fields, a report of a scientific dental discussion may stand little or no chance of being published.

News values, of course, are relative. Outside of New York and other large cities where the major newspapers try to cover all the news of all the world, the editorial emphasis may be on local events, with less space devoted to national and international affairs. Thus it often happens that in a smaller town, a dental meeting may be a big news event. In New York, dozens of meetings of various

kinds are held daily by engineering, professional, business and other organizations. The medical profession in one month recently held no less than sixteen scientific meetings. Few of these meetings are reported in the papers, because the editors consider most of the discussion material to be too technical in character to interest the general public.

In their consideration of the news merits of meetings, the papers appraise the relative public-interest values of the events themselves, as well as the topical material to be presented at them. On this basis, a national meeting usually rates more news consideration that a state meeting, while a state meeting commands more attention that a sectional gathering. However, it sometimes happens that the smaller meeting will feature something more newsworthy than the larger meeting, whereupon it will "get the call," publicitywise.

By and large, dentistry in this area fares very well indeed in the matter of publicity of its professional activities and scientific developments. That is because (1) years of effort by the Dental Information Bureau have kept dentistry in the forefront of editorial attention; and (2) dentistry is basically a subject of universal public interest.

Naturally, not everything pertaining to dentistry interests the editors or is believed by them to merit news coverage. As a rule, newspapers shy away from technical material unless it is angled in popular vein, or unless some phase of it holds public interest value, as in the case of new developments in the treatment of tooth decay or periodontoclasia, arthritis, cancer, heart disease, etc. You probably never will see a scientific essay published in a newspaper as presented at a professional meeting; if it were, very few readers would bother with it.

Consider, for example, a scientific essay on the topic: "Function of the Tongue and Its Relation to the Stability of a Lower Denture." Such a discussion, while of prime interest to dentists, holds little appeal to news editors, because of its technical nature.

Yet we are often able to draw from such discussions a news or story idea which is then angled for popular consumption. For example, at one meeting an essayist discussed the subject of oral manifestations of diabetes. From his material we drew a story on how dentists may in effect serve as "diabetes detectives" and thereby aid in saving patient's lives. This is one form of "angling." There are numerous other forms, as well as many other technics for obtaining publicity on topics which normally would command little or no editorial interest. In all cases, we utilize the most skillful and ethical professional publicity technics in our efforts to obtain favorable publicity. And while occasionally lack of space or inherent lack of news value in the subject material presented at meetings prevents our material from getting into print, it is a fact that throughout the years, the Bureau has maintained an unusually high "batting average," despite rather serious budgetary limitations.

A true sense of values is important in any realistic appraisal of dental publicity. Our function is as much to prevent unfavorable publicity as to obtain beneficial publicity. In connection with the latter it should be remembered that volume alone is no criterion. Nor is the source from which it emanates. A story in a local paper describing a worth-while dental activity or revelation in Oshkosh may be just as beneficial to dentistry's public relations in this area as one reporting a local dental society meeting. It must be remembered that no one seeks dental treatment from a dental society. Hence the value of getting the dental society's name into print is secondary to implanting a favorable impression of dentistry as a whole, or to stimulating public consciousness of the importance and value of regularly scheduled professional dental care.

We estimate that approximately 99.9 per cent of dental publicity is favorable publicity. That is indeed a high average. It speaks volumes for the functional integrity and prestige of the profession, which in themselves are the best allies

we have in publicizing and defending dentistry. It is also a tribute to the moral honesty of most editors.

Summing up our limitations and potentialities, then, we find:

1. Control of the press is impossible and, in fact, undesirable. For if we could control the press, others could do the same, whereupon the press would cease to be the medium it is for the dissemination of reliable news, information and objective editorial opinion.

2. Dentistry must compete for publicity space and time with all other components of the general social structure, as well as with everything else that is being done and thought throughout the world. Yet dentistry gets a substantial volume of publicity, 99.9 per cent of which is favorable to the profession and definitely valuable to the public it serves.

3. In this area, where the bulk of the nation's information media are centered or headquartered, the Dental Information Bureau has built up a receptivity on the part of news and editorial executives and writers that permits it to serve both as an effective medium for obtaining favorable publicity and a bulwark against the publication or broadcasting of harmful publicity.

Time and trial have shown to dentistry the value of sound public relations service such as is rendered by the Bureau—a service that is so vitally needed in this day of general unrest and social reform.

It is a service that cannot be delegated to the central office of the American Dental Association. More and more, activity on the local level is becoming the keynote of sound public relations. The A.D.A. cannot possibly devote the necessary money and manpower to local-level public relations service for its components. We ourselves must do the job, even though in doing it, we automatically do much for dentistry nationally, since New York holds the nation's largest concentration of radio and publication media. In the final analysis, it is what we do—and the way we do it—that determine public attitude and sentiment toward dentistry in this area.

Early Detection of Mouth Cancer

Dentists are in a strategic position to detect early mouth cancer, it was pointed out by a Navy dental officer in the April issue of The Journal of the American Dental Association.

Capt. M. M. Maxwell, commanding officer of the U. S. Naval Dental Clinic at Pearl Harbor, declared:

"It is the dentist on whom initial responsibility for the detection of a malignant growth in the mouth is often placed and to whom the opportunity of saving lives . . . will frequently present itself."

At the same time, Capt. Maxwell said that a hidden cancerous lesion may be present in the mouth for some time without any symptoms or complaint by the patient. If any suspicious enlargement of the neck glands is noted, a more complete examination should be given as a precautionary measure, he said.

In another article, Drs. Simeon T. Cantril and Orliss Wildermuth of Swedish Hospital, Seattle, Wash., pointed out that dentists often were the first to be consulted in cases involving cancers of the throat, sinus and tongue.

When there is pain in the teeth or the jaws that cannot be accounted for in a routine dental examination, cancer of the throat or sinus should not be ruled out, Drs. Cantril and Wildermuth advised.

In tongue cancer, they said, time is a critical factor "far more than in most malignant processes."

They asserted that cancer of the tongue is often associated with jagged teeth or ill-fitting artificial teeth and that any suspicious sore on the tongue calls for an immediate diagnostic examination.

OBSERVATIONS ON THE MERITS OF ORAL IRRIGATION

RICHARD W. SLATTEN, D.D.S., *Austin, Texas*

This paper is not intended as a report on any scientifically conducted experiment regarding the merits of irrigational apparatuses; it is merely to report the personal observations of the writer concerning the effectiveness of such an apparatus when it was the sole means in the daily home care of the mouth.

The device consists of a length of plastic hose and a metal nozzle. The plastic hose can be connected to any household water faucet by means of an expansion bolt which is connected to it. The end of the metal nozzle has six (6) extremely small openings, the diameter of which allows the water to be played upon the teeth and gingival tissues under great pressure. (See Fig. I.) Miller[1] earlier described a similar irrigation apparatus of this type whose use he advocated as "preliminary palliative therapy" before surgery was attempted in cases of pericoronitis. He also recommended such an apparatus for the treatment of acute conditions and for cleansing under stationary restorations.[2]

COMPARATIVE OBSERVATIONS

Conventional Toothbrushing	*Irrigational Device*
1. Convenient and simple to use.	1. Though this device requires relatively less dexterity than a toothbrush to render clean the teeth and surrounding areas, it is neither as convenient nor as neat to use.
2. Even after conscientious brushing, it is quite often possible to demonstrate food debris in interproximal areas.	2. The irrigational device seems very effective in flushing food debris from interproximal areas.
3. Gingival tissues remain in a state of good health with proper stimulation from a correctly used toothbrush.	3. To accurately determine the effectiveness of irrigation as a means of maintaining gingival tone, it would be necessary to observe its effect scientifically. This would require, at least, the taking of intermittent Kodachromes as well as frequent clinical examinations.
4. The writer is able to keep calcareous deposits on the lingual of lower anteriors at a minimum with brushing.	4. Calculus seems to accumulate more readily in this area when only irrigation is used.
5. The blanching and blushing of tissues resulting from good brushing leaves the gingivae with a feeling of "stimulation."	5. Although the mouth feels extremely clean after irrigation, the writer seems to notice an absence of that feeling of "stimulation" which results from brushing.
6. Malposed teeth often escape complete cleaning by brushing.	6. Malposed teeth are easily and thoroughly cleaned by irrigation.

CONJECTURES

1. Irrigational devices would be a great aid in cases of patients whose manual dexterity is underdeveloped or retarded, e.g., epileptics, spastics, patients with central nervous system involvements, and very young children.
2. Irrigation would be invaluable in cleaning stationary prosthetic appliances.
3. For home care in mouths undergoing orthodontic treatment, irrigation would probably be superior to toothbrushing in keeping the appliances clean.

4. Irrigation should probably be used as an adjunct in cases of rampant caries.
5. Unless there is a common outlet for both hot and cold water, patients with sensitivity to cold, or patients with deep periodontal pockets, would hesitate to clean these areas thoroughly.
6. In mouths in which there has been papillary destruction, irrigation would clean such areas better than brushing.
7. In mouths which have undergone surgical intervention during periodontal treatment, irrigation would provide an excellent means of cleaning areas in which the lines of gingival attachment have been altered and where bifurcations have been exposed.
8. It seems that irrigational devices would be invaluable in the home care regime of cases of acute necrotizing ulcerative gingivitis.

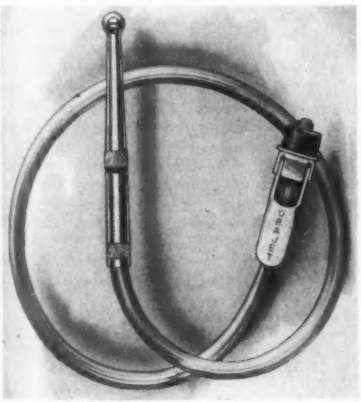

Fig. 1

CONCLUSIONS

In the mouths of patients whose teeth and gingival tissues approach normal, daily home care should probably include irrigation only as an adjunct to brushing. It does not seem that dentists should suggest the use of irrigational devices to people whose mouths maintain themselves in a high state of health with acceptable brushing methods. However, there is no apparent reason why permission for their use, as an adjunct to brushing, should not be given to patients who request them.

Irrigation should be advised for patients whose mouths have the following abnormalities or conditions or in whose mouths adequate brushing does not seem to suffice: fixed bridgework, malposed teeth, rampant caries, surgically exposed areas, orthodontic appliances, acute gingival inflammations, and loss of interproximal tissues. The appliance can be of great value to those individuals who have impaired manual function.

Finally, it is probable that irrigational cleaning should be abstained from even longer than the toothbrush following surgery and curettage in order not to risk an interference with the blood clot. An exception should be made in those cases where acute abscesses have been opened and the drainage and localization are necessary to recovery.

2301 Bridle Path

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MEDICAL VIEWS ON ORAL PROBLEMS

LEUKOPLAKIA*

To the Editor: Please give me the newest therapy for leukoplakia involving buccal mucosa.

Hugh L. Houston, M.D., Murray, Ky.

ANSWER.—Several factors are thought to contribute to the cause and progressive development of leukoplakia. Syphilis, if present, may provide a background, and the sex of the person is important, as shown by the great preponderance of leukoplakia among men. Faulty oral hygiene, poor condition of teeth or dentures and smoking are held to be locally inciting potent factors.

When leukoplakia is seen early in its development, much often can be done to retard or stay its progress. Smoking should be given up, the teeth or dentures put in good repair and strict attention paid to the hygiene of the mouth. Foods stimulating and irritating to the mucous membrane should be avoided. Vitamin A in doses of 100,000 to 400,000 units daily may be of help when taken over a prolonged period. It has been reported that estrogens are of benefit, but convincing evidence is lacking.

If patches of leukoplakia fail to thicken and progress with these measures, nothing more need be done. However, since this disorder may be the forerunner of and furnish the site for malignant growths, one should watch for evidence of such transformation. Papillary formations, fissures and ulcers demand histologic examination. If malignant changes are not present simple cauterization to include all the thickened parts causes healing with surprising rapidity and ease. If the area requiring such treatment is extensive, a systematic plan can be adopted for attacking separate areas; a new area can be chosen after the one previously treated has healed. If malignant changes are found, then surgical measures with or without radiation therapy must be employed.

* J.A.M.A., April 29, 1950.

GLOSSOPYROSIS*

To the Editor: A man aged 38, married, with three children and in good economic status, about four months ago had a bitter sensation in the tongue and a bad taste in the mouth, which became worse; now there is decided pain and distress in the tip of the tongue although nothing is seen on superficial examination. The pain is always present and is worse during the night, when it is so severe that it awakens him and he sleeps little. Results of serologic tests are negative, gastric analysis and liver function are completely normal; two abscessed teeth have been removed. He has become extremely nervous. His appetite is fair, and no particular food seems to increase the burning sensation in the tongue. I have thought of hysteria, because he has been somewhat worried about his work; also tongue neurosis, neuralgia of the tongue and vitamin deficiency. I have given hypodermically a potent preparation of vitamin B complex. Please suggest diagnosis and treatment.

Gregorio Igartua, M.D.,
Aguadilla, Peurto Rico.

ANSWER.—The diagnosis would seem to be glossopyrosis. Its occurrence, course, absence of local lesion and absence of response to therapy are characteristic. It usually develops in nervous persons; there may be a local irritant to aggravate it. The diagnosis may have to be made by history alone. The normal gastric analysis and the failure of vitamin B therapy (provided it was adequate) would seem to rule out a systemic disease or deficiency. It is presumed that the blood cell count is normal and that there is no ulceration of the lingual tonsils to cause a referred pain to the tip of the tongue. The constancy of the pain would exclude a true neuralgia of the lingual branch of the fifth nerve, which tends to be paroxysmal and reflex. Treatment is needed, because patients with glossopyrosis suffer real and severe discomfort. Relief is possible and may be dramatic. The business worries should be resolved; any fear of cancer should be relieved; sedatives may be given to eliminate the insomnia. Smoking, the use of strongly alcoholic drinks and stimulating foods should be banned for the time being. Sodium perborate or other irritating mouth washes should not be used. All irregularities on the teeth or dentures should be removed, since the patient may repeatedly run his tongue over a tiny rough spot or deposit. A vitamin B concentrate, plus liver extract, may be given empirically, although it would be wise to await the results of the other measures which have been suggested to know which are effective.

* J.A.M.A., April 8, 1950.

DECALCIFIED TEETH*

To the Editors: A young patient whose teeth are whiter near the gingival margin has been told by her dentist that her teeth are becoming decalcified and should be treated with silver nitrate. Is this an acceptable procedure and is any benefit likely to result?

M.D., Wisconsin

ANSWER.—Cervical decalcifications are not uncommon in young patients. Treatment with silver nitrate does not assure the arrest of the process. In any case, treatment with silver nitrate should be confined to the posterior teeth only, since a heavy black precipitate of

silver is formed on the decalcified area. For the anterior teeth, painstaking oral hygiene by the patient plus careful smoothing and polishing of the decalcified areas by the dentist is indicated. If the decalcification has penetrated to the dentin, fillings should be placed.

* J.A.M.A., April 8, 1950.

CIGARETTES AND BUERGER'S DISEASE*

To the Editor: Buerger's disease was the diagnosis in a male Jewish patient, aged 42. The condition is confined to the lower extremities. The dorsalis pedis and posterior tibial arteries are feebly perceptible; there is considerable blueness of the dependent foot, and pain and claudication are increasing. The condition has been present about a year and has been fairly well controlled with typhoid injections and vasodilators. I have stressed the importance of the patient's stopping cigaret smoking, but the man does not have the will power. He smokes 7 to 8 a day, whereas before treatment the number was 20 to 30. I have searched for a medical treatment that will aid this man to overcome this dangerous habit but have found nothing in the medical journals. Recently I have noticed a remedy called "tobacco redeemer." This is an advertised concoction, and before this man tries it I should like to know what it contains and any other suggestions.

Arthur J. Langan M.D., San Pedro, Calif.

ANSWER.—There is no known positive method of curing or preventing the smoking of cigarets. There are numerous ways of conditioning a cigaret smoker so that smoking results in an extremely foul taste in the mouth and makes the patient feel uneasy. Such technics are dependent somewhat on the help that the involved one gives. If the patient does not cooperate these methods usually fail. Denicotinized cigarets have been tried, but usually, because there is some nicotine in them, vasoconstriction results. -The following plan is suggested: Tell the patient that he must stop smoking entirely or his condition will progress until gangrene of the involved region occurs and when this appears he will have to have the extremity amputated. The only other suggestion is that you refuse to treat him. This may result in a feeling in which the patient will do everything that you ask of him. The content of the "tobacco redemmer" is not known.

* J.A.M.A., Dec. 17, 1949.

EXPLOSIVE GAS IN MOUTH*

To the Editor: A man ignited his cigaret with a blowtorch. Immediately there was an explosion in his mouth and he said he could see flames shoot out of his mouth for a few inches, with, to him, an audible report. He bled a little from his mouth, and the inside of his mouth and his throat were bruised and slightly abraded. He had no pulmonary injury and an uneventful recovery. How did he get an explosive gas in his mouth? I would think that he drew in some gasoline vapor, back of the flame, through the cigaret and then it ignited and exploded in his mouth.

H. D. Murdock, M.D., Tulsa, Okla.

ANSWER.—The gas of intestinal flatulence as discharged through the anus is ordinarily inflammable. The gas of gastric flatulence commonly is swallowed air and is not inflammable On occasion, due to putrefaction or fermentation of gastric contents, enough methane arises that on eructation simultaneous with tobacco lighting, a small flash occurs. This event is rare. The occurrence of unburnt gasoline vapor about a blowtorch from leaks, leading to a flash about the face, is not denied as a possibility.

* J.A.M.A., Dec. 24, 1949.

Question and Answer Column to Be Added

Requests have been received for the inclusion of a "Question and Answer" column as a regular feature of the Journal of Dental Medicine. The editorial staff would be pleased to comply with this suggestion should sufficient material be received.

If our members or non-member subscribers have problems related to dental medicine incidental to practice which they wish to submit, they will be forwarded to authorities on the subject and answered in future issues of the Journal. Names of those submitting questions will only be printed if requested.

AMERICAN ACADEMY OF DENTAL MEDICINE ANNUAL AWARD 1950

Upon recommendation by their respective medical and dental colleges the following senior students have been nominated for the Award for Proficiency in Dental Medicine given annually by the American Academy of Dental Medicine. This award consists of a duly inscribed certificate and a five year subscription to the Journal of Dental Medicine.

DENTAL SCHOOLS

Nominee	*Recommending Officer and School*
HENRY ADELSON 315 East 77th Street, New York, New York.	Walter H. Wright, Dean, New York University College of Dentistry.
THOMAS G. BARKER 126 S. 5th Street, Lewisburg, Pennsylvania.	J. L. T. Appleton, Dean, University of Pennsylvania.
M. K. BAUMAN 10945 - 90 Avenue, Edmonton, Alberta, Canada.	W. Scott Hamilton, Dean, Faculty of Dentistry, University of Alberta.
WILLIAM C. BRINGS University of Pittsburgh, School of Dentistry, Pittsburgh, Pennsylvania.	L. E. Van Kirk, Dean, Dentistry, University of Pittsburgh.
HARVEY BROADBENT 129 East Broadway, Louisville, Kentucky.	Raymond E. Myers, Dean, University of Louisville School of Dentistry.
ARTHUR M. BUSHEY 216 Paradise Avenue, Cantonsville 28, Maryland.	J. Ben Robinson, Dean, Baltimore College of Dental Surgery, University of Maryland.
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Nominee	*Recommending Officer and School*
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BOOK REVIEWS

Medicine of the Year 1950. Second issue, Philadelphia, Pa. J. P. Lippincott, 1950. 204 p. $5.00.

This volume on current contributions of the year is an excellent refresher course for the practitioner. It charts the level of advance in every phase of disease. It presents the real effectiveness of new developments. It reveals those who fail to measure up to therapeutic expectations. Each review presents the predictions that have come true and those that have not; the drugs that have succeeded as against those that have failed; the concepts that have been proven as against those that have not stood the test of time. The chapter on Internal Medicine reveals the story of the current status of the antibiotics, virus infections, anemias and of newly isolated tumors. The chapter on psychiatry stresses psychophysiologic studies, recognition of early schizophrenics and the psychiatric component in chronic disease; management of chronic alcoholism and psychosurgery. The chapter on obstetrics presents the rooming in technic; abuse of sedation; value of saddle block; hormonal therapy; toxemia of late pregnancy and surgical complications. The chapter on pediatrics reveals the management of epidemic diarrhea; metabolism of newborns; surgical course of thoracic deformities; immunization against diseases; congenital toxiplasmosis; collagen diseases; developmental anomalies and allergic disorders. The chapter on surgery presents Bacitracin as a superior biotic; value of gelfoam in hemorrhage; new procedures in neurosurgery; lobectomy for bronchiestasis; bilateral sympathectomy; ACTH in malignant tumors. The book is a revelation in medical progress.

I. NEWTON KUGELMASS

Current Therapy 1950. Edited by Howard P. Conn, M.D., 2nd in series, Philadelphia, Pa. W. B. Saunders Co., 1950. 738 p. $10.00.

This current volume brings to the practicing physician authoritative information for the treatment of disease. The methods formulated are exactly as prescribed by the contributing clinician. It is an excellent means of deleting obsolete methods and initiating tried and tested therapeutic procedures. Every possible clinical subject is included. It is not a review of the literature or a summary of the recent advances. Rather, it is a record of current treatment procedures as practised by various specialists in each field of endeavor. Emphasis is placed on everyday practice amenable to both hospital and office patients. The treatment is in outline form, clearly presented for quick reference and effective results.

I. NEWTON KUGELMASS

Bacterial Infection in Dental Practice (First Edition). By J. L. T. Appleton, D. D. S., Philadelphia, Pa. Lea & Febiger, 1950. 644 p., 108 ill. $10.00.

Dean Appleton has set a cornerstone in the edifice of dental medicine. This is not just another text on bacteriology, it is a step by step development of the nature of infection and the mechanism of defense, with particular emphasis on special infections of the oral cavity.

The style of the text is forthright, and the material is well substantiated. The author writes with an enthusiasm that should infect the scholar as well as the student. It fills gaps in dental education that only years of clinical experience and post-graduate study might provide. It correlates many of the specialties of medicine with those of dentistry in a fresh and physiologic manner.

The text is divided into three parts. Part 1 is bacteriology, including viruses, and contains references to antisepsis and antibiosis. Part 2 is a magnificent treatise on the nature of infection: how bacteria produce disease, and the various defenses. Then an excellent chapter on the characteristics of infection—course and types.

The final section on special infections of the oral cavity includes an excellent discussion on ecology of the oral cavity, dental caries, and the bacteriology of the dental pulp, periapical and periodontal tissues.

This is not just a book about bacteria. It is a philosophic correlation of many phases of academic study.

A. N. Y.

Acrylic Inlays, Crowns and Bridges. By Irwin Robert Levy, D.D.S., Philadelphia, Pa. Lea & Febiger, 1950. 128 p., 151 ill. $3.75.

This book makes a valuable addition to the library of the general practitioner. For a technical volume, it is very readable and well illustrated.

The introductory chapter gives an outline of the development of plastics and their application in Dentistry. When dealing with materials and their active manipulation, shaping, and shading, the author is supplying information in a field which is relatively new. His treatment of the subject also covers the indications and contraindications of the material. He includes information usually found in the older texts on Operative and Prosthetic Dentistry: such as, classification of cavities, cavity preparation, technics of impression-taking, etc.

The general aim of the book is to resolve some misunderstandings, and to present some of the author's clinical experiences. This he

has done; and, in so doing, has produced a compact volume containing much useful information.

M. E.

A Textbook of Oral Hygiene and Preventive Dentistry. By Russell W. Bunting, D.D.S. and collaborators, Philadelphia, Pa. Lea & Febiger, 1950. 240 p., 135 ill. $5.00.

Dentistry is a young profession and its first years have been primarily devoted to the replacement and restoration of teeth. The backlog of written material dealing with corrective measures is tremendous. A more logical approach, that of prevention, was obviously needed. Lately this challenge is being met both from a periodontal and caries standpoint.

Dr. Bunting's new book has been motivated by this purpose and has succeeded admirably in making a case for prevention. In his preface he says, "The purpose of this text is to present the field of preventive dentistry and to state such related factual data as have been supported by adequate scientific investigation."

The author has been assisted by outstanding collaborators in the preparation of this book. Included are chapter contributions by Lester Burket on Stomatitis, Lester Cahn on Oral and Systemic Disease, Donald Kerr on Histology and Traumatic Occlusion, Hamilton Robinson on Periodontia and Jacob Wisan on Public Health Dentistry.

Although many of the topics covered are still controversial, the evidence both pro and con is presented in a forthright unprejudiced manner. Of particular interest to this reviewer was Cahn's short but provocative chapter on Focal Infection. Here the swing of the pendulum in this field is carefully traced and oral infection placed in its proper position as an etiologic factor in the cause of metastatic lesions elsewhere in the body.

This book is decidedly up to date. The chapter on Caries Prevention includes all of the latest data on the fluorides and ammoniated dentifrices.

N. W.

Motor Disorders in Nervous Diseases. By Ernst Herz M. D. and Tracy J. Putnam, M. D., New York. King's Crown Press, 1946. 184 p., $3.00.

This illustrated monograph represents an atlas of motor disorders in nervous diseases. It enables more accurate diagnostic delineation with due interpretation of the underlying mechanisms involved in involuntary movements, disorders of gait, disorders of coordination, ocular motor disorders, vestibular disorders and other common nervous disturbances.

Of all the functions, normal and abnormal, under nervous control, motor phenomena have been studied most extensively. The intricate organization of the nervous system, from the mechanisms of action of a single motor fiber to patterns of motor behavior of animals and man, has been the object of countless investigations. Chemical and electrical experiments, psychologic tests and cilinical investigations of various disturbances of the motor apparatus have contributed many details to our knowledge of motor disorders and their physiologic background. The relation between motor functions and certain anatomic structures of the nervous system has been explored by experimental studies in animals and by the evaluation of localized lesions in disease producing motor disorders.

If one looks at the schedule generally used in neurologic examination, one recognizes the value of this investigative work. The evaluation of motor functions occupies the main part of all the different examinations and tests. Our diagnostic considerations are to a large extent governed by the normality, dysfunction or distortion of motor functions.

I. Newton Kugelmass

Treatment in Psychiatry. By Oskar Diethelm, M.D., Springfield, Ill. Charles C. Thomas, 1950. 564 p. $8.50.

Progress in psychiatric treatment during the last decade has been marked along several lines. Somatic procedures have become well established. Advances in psychotherapeutic methods in adults and children have been valuable. It has become generally accepted that therapy frequently must be directed toward the individual members of the patient's family as well as toward the patient himself. A closer relationship with the other medical disciplines, especially with internal medicine and pediatrics, has been mutually fruitful. This evolution of treatment has necessitated considerable changes in this new edition.

Since the province of psychiatry covers all disorder and malfunctioning of the personality, this book deals not only with the treatment of the major illnesses designated as psychoses and neuroses, but also with the minor personality reactions of everyday life and with reactions to physical illnesses and handicaps. In the first six chapters the general principles of treatment and various methods are outlined; in the remaining eleven chapters, the treatment of specific reaction patterns, grouped more from a therapeutically practical than a nosologic point of view. At the beginning of several of the chapters a brief discussion of the psychopathology is offered, as a necessary theoretical basis for the treatment outlined afterwards.

I. Newton Kugelmass

Textbook of Pediatrics. Edited by Waldo E. Nelson, M.D., V edition, Philadelphia, Pa. W. B. Saunders Co., 1950. 1658 p. 426 illus. $12.50.

This new edition embraces the general practice of pediatrics. Each phase of the subject is treated by one versed in the field. It thus becomes a source book interpreting recent advances in medicine to the everyday practice of pediatrics. There are excellent monographs on growth and development, congenital malformations, infections, immunizations and allergy, and viral diseases. Each chapter is a complete entity from etiology to therapy followed by selected references from the world literature. The book is beautifully illustrated and is the best textbook in the English language.

To the practicing dentist this book presents the current concepts in the management of well and sick children. The dentist should become versed in the course of physical growth, and development, in the type of feeding in early childhood that will produce desirable dentition, preventive measures in warding off diseases that will interfere with dental health, congenital malformations reflected in the mouth and local and oral manifestations of systemic diseases. These are some of the manifold aspects of pediatrics that dentists should become familiar with from time to time as systemic problems arise in connection with dental practice.

I. NEWTON KUGELMASS

Physiology of Heat Regulation and the Science of Clothing (First edition), edited by L. H. Newburgh, M.D., Philadelphia, Pa. Saunders, 1949. 457 p., 250 ill. $7.50.

Man is in possession of an elaborate and complicated mechanism which keeps his internal organs at a nearly constant temperature. This implies that heat is lost by the organism at the rate at which it is produced. The heat is carried from the warmer interior to the cooler body surfaces by the blood and to a lesser extent by conduction across the tissues. It is dissipated from these surfaces by radiation, convection and evaporation of water. The part played by each of these factors and their integration had been adequately described for conditions which in retrospect could justifiably be thought of as moderate or median states.

The members of the committee, while recognizing that this information formed a fundamental basis for their future studies, quickly realized that they must concentrate upon discovering the extreme limits of this mechanism. They must determine the maximal rate of heat production that can be endured in the hottest and most humid environments. At the other extreme, it must be learned how long survival is possible in cold water and very cold air, and to what extent and for how long man can survive in the cold by increasing his production of internal heat through muscular activity.

It was common knowledge that the loss of heat is lessened by clothing, but no one knew how much protection could be obtained by this means. The clothes worn by man were dictated by custom and fashion. Little thought had been given to the protective possibilities inherent in the raw fibers and in various ways they could be combined into cloth. Might not a study of the physical qualities of fabrics form a basis for devising new textiles that were better heat barriers than any then available? What profitable information could be obtained by examining the clothing and shelter customs of groups that had survived in the extremes of climate?

This book attempts to describe the responses of the heat regulatory mechanism to the whole range of climatic conditions encountered on the earth's surface. It emphasises the maximal capacity of the mechanism to preserve life under how far the rigors of unfavorable environments can be mitigated by scientifically designed protective coverings. However, it does not assume to have given final answers. The studies are being continued by both military and civilian groups.

I. NEWTON KUGELMASS

Index to Dental Liturature, January-March 1950. Published by The American Dental Association, Chicago, Ill. $30 a year.

This is the latest addition to the list of American Dental Association publications and will fill a long felt need for a ready reference to the current literature. Heretofore, it was published every three years. Those who wanted a reference in the interim were required to subscribe to a monthly card service which cost $60.00 a year. The new Index replaces the card service and costs only $30.00 a year.

This first quarterly Index contains citations from 141 dental magazines published around the world. There is an author index as well as a subject index. It's an indispensable tool for dentists, researchers, manufacturers—in fact, everyone who has a continuing interest in dentistry.

ANNOUNCEMENTS

School of Dentistry University of Pennsylvania Postgraduate Courses

The School of Dentistry of the University of Pennsylvania is offering 36 Postgraduate Courses on 23 different subjects during the academic year 1950-51. Courses in Airbrasive Technic (Drs. Gabel & Leander), Cleft Palate Treatment (Drs. Ivy & Cooper), Ceramics (Dr. Simonsen), Complete Denture Prosthesis (Dr. DeVan), Complete Denture Prosthesis (Dr. Trapozzano), Crown and Bridge Precision Attachment Prosthesis (Dr. Granger), Course for Dental Assistants (Dr. Kneisel), Dental Surgery & Anesthesia (Dr. Meloy), Dentistry for Children (Dr. Gabel), Endodontics (Dr. Grossman), General Anesthesia in Dentistry (Dr. LaDow), Mechanical Principles of Restorative Dentistry (Dr. Gabel), Mouth Rehabilitation (Dr. Leof), Oral Cancer (Dr. Boyle), Oral Diagnosis & Roentgenology (Drs. Ennis & Burket), Oral Hygiene (Dr. Hellwege), Orthodontics (Dr. Ross), Partial Denture Design (Dr. Trapozzano), Periodontics (Dr. Burket), Periodontics & Oral Medicine (Drs. Burket & Winter), Prevention and Control of Dental Caries (Dr. Grossman), and Roentgenologic Technic & Interpretation (Dr. Ennis) have been scheduled.

The Second Mid-Atlantic States Seminar in Oral Medicine at Skytop, Pennsylvania, is also being offered by the Postgraduate Courses. Drs. Appleton, Becks, Burket, Krogman, Moore, Orban, Ryan, Thompson and Weinmann will present this seminar, which will be held 5 to 10 November, 1950, immediately following the National A.D.A. Meeting in Atlantic City.

In addition to the postgraduate courses scheduled at the School of Dentistry, extension courses can also be arranged for professional groups who wish to receive postgraduate instruction in their own locality.

Enrollment in these postgraduate courses is limited to members in good standing of the American Dental Association. These courses can be taken under the provisions of Public Law 346, upon the presentation of a satisfactory Certificate of Eligibility and Entitlement. For further information about these courses write Director, Postgraduate Courses, School of Dentistry, University of Pennsylvania, 4001 Spruce Street, Philadelphia 4, Pa.

A.D.A. Convenes in Atlantic City

Preparations for the 91st annual session of the American Dental Association at Atlantic City, Oct. 30 to Nov. 2, moved forward rapidly with the opening of the official housing bureau for the four-day meeting.

This year a new system of making hotel assignments will be followed. Reservations will be made as much as possible in accordance with the preference of the convention visitor instead of making priority classifications that were used formerly.

Official application forms may be found in *The Journal of the American Dental Association*, beginning with the May issue. Accompanying the application forms are detailed maps indicating the location of each hotel and the rates for each.

Reservations may be obtained by filling out the application blank and mailing it to the A.D.A. Housing Bureau, 16 Central Pier, Atlantic City, N. J. All reservations will be handled by the Bureau. The applicant will receive confirmation of his reservation directly from the hotel.

A record-breaking attendance has been predicted by Dr. Harold Hillenbrand, A.D.A. secretary, and it is advised that reservations be made early in order that any preferences for hotels can be granted.

Already, hotel assignments have been made for meetings of associated dental groups for the annual session. Among these are the American Academy of Periodontology, at the Claridge; American Academy of Restorative Dentistry, Chalfonte-Haddon Hall; American Association of Dental Editors, Traymore; American Association of Dental Examiners, Traymore; American Association of Public Health Dentists, Dennis; American Board of Oral Pathology, Claridge; American College of Dentists, Claridge, and American Dental Assistants Association, Chalfonte-Haddon Hall.

Others are the American Dental Hygientists Association, Chalfonte-Haddon Hall; American Denture Society, Seaside; American Society of Dentistry for Children, Ambassador; American Society of Oral Surgeons, Ritz-Carlton; Delta Sigma Delta, Marlborough-Blenheim; International College of Dentists, Chalfonte-Haddon Hall; National Association of Seventh Day Adventist Dentists, Dennis; Psi Omega, Ambassador, and Xi Psi Phi, Shelburne.

The Second Mid-Atlantic States Seminar In Oral Medicine

The Postgraduate Courses of the School of Dentistry of the University of Pennsylvania is offering the Second Mid-Atlantic States Seminar in Oral Medicine at Skytop Club in Pennsylvania's famous Pocono Mountains, on 5 to 10 November 1950. The seminar has been scheduled for the week immediately following the 1950 convention of the American Dental Association in Atlantic City. The general theme of the second seminar deals with the biology of bone and growth and development as it affects, or is affected by the teeth and jaws, the anatomy and pathology of the periodontal tissues and diseases of the blood of interest to the general practitioner. An outstanding Faculty has been assembled for this purpose and the contribution of each clinician and investigator has been integrated for the most effective presentation of the subjects.

The clinician include Dr. Wilton Marion Krogman on Growth and Development, Dr. Joseph P. Weinmann on the Biology of Bone and Bones, Dr. Carl V. Moore on Diseases of the Blood of Interest to the Dentist, Dr. Edward J. Ryan on Psychosomatic Aspects of Dentistry, Dr. John R. Thompson on the Temporomandibular Joint, Dr. Balint Orban on Periodontal Disease, and Dr. Lester W. Burket on Oral Medicine and Dr. J. L. T. Appleton.

Attendance for participation is limited to members in good standing of the A.D.A., A.M.A., or similar or comparable groups. The fee for this seminar, including registration, lodging and meals for the five days is $225.00. Veterans who can furnish a satisfactory Certificate of Eligibility and Entitlement will receive a credit of $150.00 toward the total fee. Enrollment is limited. Applications will be accepted in the order they are received.

For further information write—Dr. Lester W. Burket, Director, Postgraduate Courses, School of Dentistry, University of Pennsylvania, 4001 Spruce Street, Philadelphia, 4, Pennsylvania.

N.Y.U. Announces Periodontia Postgraduate Course

PERIODONTIA 122 (continuous, daily, one year)

This one-year course consist of lectures, motion pictures, models, demonstrations with clinical practice in all phases of periodontal diagnosis and treatment, including conservative and radical techniques and equilibration of occlusion. Each registrant must acquire sufficient clinical experience to prove his skill in the handling of all phases of periodontal disease. He is also required to prepare an original thesis on a phase of the subject, this to be presented before the class for discussion. Courses in periodontia are under the supervision of Professor Samuel C. Miller.

One academic year, daily, 9 a.m. to 4 p.m., September 19, 1950, to May 26, 1951. Limited to 4. Tuition $1,000.00. Books $27.00. Instruments approximately $95.00. Rental fee $1.00.

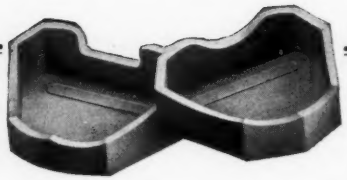
For further information apply to:

Director; Postgraduate Division

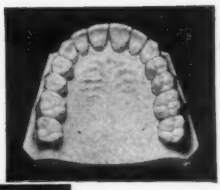
NEW YORK UNIVERSITY, COLLEGE OF DENTISTRY

209 East 23rd Street

New York City, N. Y.



MAKE Demonstration MODELS from SURPLUS PLASTER



Columbia Rubber MODEL FORMERS

Make Neat Bases on Your Study Models

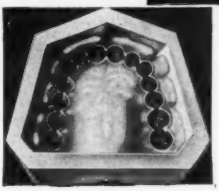
POUR plaster or stone into Model Former, mount anatomical cast and let set. The soft flexible rubber permits easy removal of model, which comes out with a perfectly smooth, symmetrical and finished base.

Upper and lower models can be made in these formers to occlude automatically!

Price per set, 1 Upper & 1 Lower

No. R1—Large Size $3.50
No. R2—Medium Size 3.50
No. R3—Small Size 3.00

Study models show patients their mouths as you see them. Make study models regularly. You need them as you do X-Rays.



with COLUMBIA RUBBER DENTOFORM MOLDS

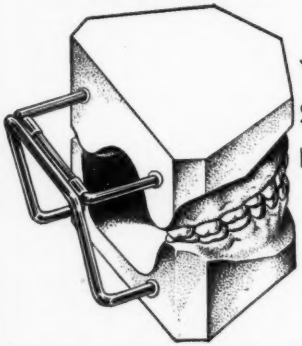
Better than sketches to explain cases to patients

Instead of wasting surplus plaster pour it into the Mold. If not enough, add the next excess mix, first wetting the set plaster. To make Models with Ivorine abutment, insert Ivorine Teeth into Mold before pouring.

Sets of Upper and Lower Molds Now Available

No. R20—A set without 3rd molars $5.00
No. R22—A set with 3rd molars 5.00
No. R24—A set for deciduous models 5.00
Ivorine Teeth, each ..... .50

ARTICULATE



Your Study Models

The Columbia Study Model Articulator is of sturdy construction, being made of ⅛ inch diameter nickel-silver rod.

To mount models, drill the four holes (template and drill supplied) and attach prongs with sticky wax. To remove articulator from cast, merely heat prongs and withdraw. Casts remain unmarred.

These articulators can be used repeatedly.

PRICES

Cat. No. 805—Four Columbia Study Model Articulators with Template and Drill $3.00
Cat. No. 806—Additional Articulators, each .60

Columbia ARTICULATOR FORMER

for INLAY DIES

A Time Saver — Easy To Use

Makes Neat Models

A simple device for casting neat, self-articulating half-jaw stone or plaster models for inlays, crowns and bridges. . . . The sliding frames are adjustable to make models of any required length. . . Models of right or left side can be made by reversing position of frames . . . The T-lock, cast in heel of upper and lower models keeps them in correct centric relation. . . . The frames, T-lock former and metal parts attached to Bakelite block are made of rustless steel.

PRICE—Cat. No. 901 ..... $1.75

Complete with illustrated directions

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